

Appl. No. 10/682,087

## REMARKS/ARGUMENTS

### Status of Claims

Claims 1-20 remain in the application.

### 35 U.S.C 103 Claim Rejections

The requirements for establishing a prima facie case of obviousness as set out in the MPEP Section 2143.01 require that the reference or references when combined teach all of the claimed limitations, that there be a reasonable expectation of success in realizing the claimed invention, and that there be a motivation to combine the references.

The Examiner has rejected claims 1-20 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,958,986 (Cain) in view of U.S. Patent No. 7,058,018 (Hasty Jr.).

The Examiner alleges that Cain discloses "a method of selecting a communication path, in a wireless network comprising a plurality of nodes and wireless communication links between the nodes, from a plurality of potential communication paths comprising different combinations of said links from a source node to a target node". In particular, the Examiner states this is disclosed in Figures 4 and 12-16.

Cain discloses "scheduling a respective semi-permanent time slot to establish a communication link with neighbouring mobile nodes for transmitting data therebetween" (abstract). Cain does not suggest or disclose that the communication link is selected from a plurality of potential paths comprising different combinations of links between a source and target node. Cain is directed to scheduling a respective semi-permanent time slot between a node and neighbouring nodes over respective individual links. For each respective pair of nodes having a single link between them, there is no plurality of potential communication paths having different combinations of links, there is a single communication path having a single link. Therefore, Cain does not disclose "selecting a communication path from a plurality of potential communications path" as recited in claim 1.

The Examiner further alleges that Cain discloses "determining for each link in the potential communication paths a cost of interference dependent upon a number of nodes affected

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by a signal sent via the respective link". In particular, the Examiner states that this functionality can be found at column 2, lines 21-67.

The subject matter of claim 1 is directed to selecting a communication path from a plurality of potential paths as a function of interference that is dependent upon a number of nodes affected by the signal sent over each respective link. Therefore, by selecting a communication path with a lowest total cost, which is recited in the third step of the claim, the selection is directed to mitigating the interference caused to neighbouring nodes from the signal travelling along the selected communication path.

Cain is directed to determining how interference from other neighbouring nodes affects the transmission of a source node as opposed to how transmission from the source node will affect nodes neighbouring the respective links of the plurality of potential transmission paths. For example at column 3, lines 11-18, Cain discloses "The controller may also schedule a directional communication link to a neighboring mobile node during a time slot by determining relative positions of the neighboring mobile node and other potentially interfering mobile nodes transmitting during the time slot, and determining potential interference to the directional communication link based upon the relative positions" (emphasis added). Therefore, Cain does not disclose "determining for each link in the potential communication paths a cost of interference dependent upon a number of nodes affected by a signal sent via the respective link" as recited in claim 1.

The Examiner alleges that Cain discloses "determining a total cost for each potential communication path, the total cost being dependent upon combined costs of interference for the links of the respective potential communication path". In particular, the Examiner states this can be found at column 3, lines 11-52.

As discussed above with respect to the first method step of claim 1, Cain does not disclose "determining for each link in the communication path a cost of interference dependent upon a number of nodes affected by a signal sent via the respective link". As Cain does not disclose a plurality of potential paths comprising different combinations of links between source and target nodes to select a communication path from, Cain cannot determine a total cost for each potential communication path. Therefore, Cain does not disclose "determining a total cost for

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each potential communication path, the total cost being dependent upon combined costs of interference for the links of the respective potential communication path" as recited in claim 1.

The Examiner concedes that Cain does not teach "selecting as a communication path from the source node to the target node a potential communication path having a lowest total cost". However, the Examiner states that Hasty, Jr does teach this limitation. In particular, the Examiner points to the description in Hasty, Jr at column 2, line 55 to column 3, line 22.

Hasty, Jr discloses selecting a path from a plurality of possible paths "having the least loss as a medium for transporting packets" (column 2, lines 54-67). However, Hasty, Jr does not teach selecting as a communication path a potential path having a lowest total cost where the total cost is dependent upon combined costs of interference caused by the source node transmission.

As discussed above, Cain and Hasty, Jr do not include all the limitations of independent claim 1, either alone or in combination. The Examiner has failed to satisfy the first criterion for establishing a *prima facie* case of obviousness, namely that the reference or references when combined teach all of the claimed limitations.

Applicant further submits that there would be no reasonable expectation of success in a combination of subject matter of the two references. As discussed in detail above, neither of the two references suggests or discloses mitigating interference of nodes neighbouring links of a communication path where the interference is caused by the signal transiting the communication path. Without all the limitations of claim 1 being disclosed by the two references it is not reasonable to expect to achieve the claimed invention by combining the references. Therefore, the Examiner has failed to satisfy the second criterion for establishing a *prima facie* case of obviousness.

In addition the Examiner has not adequately shown a motivation to combine the references as the prior art does not suggest, either alone or in combination the desirability of the claimed invention. In other words one skilled in the art would not be motivated to look to these two references when addressing the problem addressed by the present invention, as they do not include all the elements necessary to solve the problem.

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Finally, Applicant submits that using Cain in combination with Hasty, Jr would change the principle of the operation of the system described in Cain. A fundamental aspect of what Cain discloses is interference avoidance/mitigation for the received signal. Cain does not suggest or disclose being concerned with how the transmitted signal interferes with neighbouring nodes and consequently how the neighbouring node's signals are ultimately affected by nodes that receive them. Cain determines potential interference with the directional communication link caused by neighbouring nodes, which is fundamentally different than what is recited in claim 1. Furthermore, Cain does not suggest a plurality of communication paths having different combinations of links between source and target node. Applicant submits that because using Cain in combination with Hasty, Jr would change the principle of operation of Cain, the teaching of the references is not sufficient to render the claims *prima facie* obvious.

As the Examiner has failed to satisfy the necessary criteria for establishing a *prima facie* case of obviousness with respect to claim 1, for at least the reasons discussed above, Applicant submits that claim 1 patentably distinguishes over the cited references of Cain and Hasty, Jr, either alone or in combination. It is respectfully requested that the Examiner reconsider and withdraw the obviousness rejection to claim 1.

Claim 12 is directed to a node for a wireless network being operable in accordance with the method of claim 1. Claim 17 is directed to a wireless network comprising a plurality of nodes in accordance with claim 12. For at least the reasons discussed above, Applicant submits that claims 12 and 17 patentably distinguish over the cited references, either alone or in combination. Applicant respectfully requests that the Examiner reconsider and withdraw the obviousness rejection to claims 12 and 17.

Claims 2-11, 13-16 and 18-20 are dependent upon claim 1, either directly or indirectly. For at least the above-discussed reasons pertaining to claim 1, Applicant submits that claims 2-11, 13-16 and 18-20 patentably distinguish over the cited references, either alone or in combination.

Furthermore, with respect to claim 2, the Examiner alleges that the limitation of "determining for each link in the potential communication paths a cost of transmission dependent upon a data rate for a signal sent via the respective link, wherein the total cost determined for

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each potential communication path is also dependent upon combined costs of transmission for the links of the respective potential communication path” is disclosed in Cain at column 2, lines 28-56, column 8, line 43 to column 9, line 30 and column 36, lines 45-64. Applicant disagrees with the Examiner’s allegation. Cain discloses that link utilization metrics are determined that are used for different data priority levels being transmitted over the communication link. In one example, Cain discloses that increased capacity link utilization metrics are used for re-allocating the designated demand assigned time slots (column 2, lines 50-56). However, Cain does not suggest or specifically disclose that “a cost of transmission dependent upon a data rate for a signal sent via the respective link” is determined for each link. Also, as discussed above, as Cain does not teach multiple potential communication paths each having different combinations of links between source and target nodes, Cain does not disclose a total cost being determined for each potential communication path.

With respect to claim 3, the Examiner alleges that the limitation of “determining for each link in the potential communication paths a cost of coordination of transmissions on the link with transmissions from other nodes of the network, wherein the total cost determined for each potential communication path is also dependent upon combined costs of coordination for the links of the respective potential communication path” is disclosed in Cain at column 2, lines 28-56, column 8, line 43 to column 9, line 30 and column 36, lines 45-64. Applicant disagrees with the Examiner’s allegation. Cain discloses a traffic coordination unit at column 8, line 57 to column 9, line 4, but there is no suggestion or specific disclose that “a cost of coordination of transmissions on the link with transmissions from other nodes of the network” is determined for each link. Also, as discussed above, as Cain does not teach multiple potential communication paths each having different combinations of links between source and target nodes, Cain does not disclose a total cost being determined for each potential communication path.

Furthermore, with respect to claims 5, 6 and 7, these claims recite similar subject matter with different claim dependencies. The Examiner alleges that the limitation of “the source node determines the total cost for each potential communications path as a sum of the combined costs for the links of the respective potential communication path” is disclosed in Cain at column 9, line 38 to column 10, line 31. Applicant disagrees with the Examiner’s allegation. At the cited

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location Cain discloses prioritizing links when establishing a communication link, scheduling semi-permanent time slots on unused communication links, exchanging positional information with an omni-directional antenna and detecting interference. Applicant submits that Cain does not suggest or specifically disclose the "total cost for each potential communications path as a sum of the combined costs for the links of the respective potential communication path" as recited in claims 5, 6 and 7, especially in view of the fact that Cain does not disclose selecting a communication path from a plurality of communication paths comprising different combinations of communication links.

In addition, with reference to claim 11, the Examiner alleges that "the cost of coordination for each link in the potential communication paths determined by the source node is also dependent upon a time interval required for coordinating activities" is disclosed in Cain at column 9, line 19 to column 10, line 31. Applicant disagrees with the Examiner's allegation. Applicant has discussed above what is disclosed from column 9, line 38 to column 10, line 31. The additional subject matter disclosed at column 9, lines 19-38 is directed to timing scheduling requests. Cain does not suggest or disclose that timing of the scheduling requests have an associated "cost of coordination".

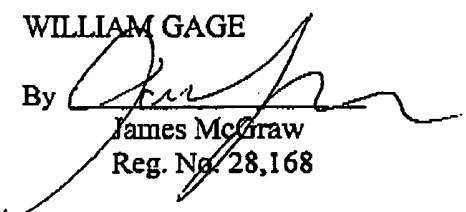
Claims 13, 14, 15, 18, 19 and 20 are dependent upon claims 2 or 3, either directly or indirectly. Applicant submits that the additional reasons discussed above with regard to claims 2 and 3 provide further evidence that claims 13, 14, 15, 18, 19 and 20 patentably distinguish over the cited references.

In view of the foregoing, early favorable consideration of this application is earnestly solicited.

Respectfully submitted,

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